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MILITARY

COMPARISON OF TAN-SAM WITH ROLAND

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 pp 5-6

[Text]

The JDA briefed the Policy Affairs Research Council of the ruling Liberal-Democratic Party last week on the domestically developed short-range surface-to-air missile (Tan-SAM) in comparison with the Euromissile Roland as Democratic Socialist Keigo Ouchi asked questions on the two missiles at the Diet (parliament) in October prior to procurement of the Tan-SAM by the ASDF and GSDF in FY 1981.

According to sources, the Tan-SAM features simultaneous detection and tracking of multiple targets and a longer target range than other infrared short-range missiles. No control is necessary after launching. As to the Roland, all parts of the system can be mounted on a single vehicle for mobility and it features all-weather capability.

The Tan-SAM's radar range is about 50 percent greater than the Roland. Although the Tan-SAM can detect and track multiple tragets simultaneously, the Roland detects multiple targets with a search radar and tracks only one target with a tracking radar.

In launching, two Tan-SAMs can be launched simultaneously. The Roland can not do this. Tan-SAMs can be launched continuously against multiple targets, while the Roland cannot be fired until a preceding one hits a target. There is no launching limitations on the Tan-SAM. Some limits exist on vertical launching of the Roland.

The Tan-SAM's price is set at about ¥2,300 million per launching unit, compared with about ¥3,300 million for the Roland on the basis of the US Defense Department's estimate. The Tan-SAM's life-cycle cost is lower than the Roland.

The JDA's introduction of the Tan-SAM can contribute to increasing employment in related industries. But adoption of the Roland would have no such effect.

Specifications of the Tan-SAM and the Roland follow:

	Tan-SAM	Roland
Length	207 cm	204 cm
Body diameter	16 cm	16 cm
Weight	100 kg	63 kg
Guidance	Airborne lock-on infrared passive homing	Radar command
Range	about 7 km	about 6 km
Maximum speed	about Mach 2.4	about Mach 1.6
Manufacturer	Toshiba	Euromissile (Boeing and Hughes in USA under license)

CSO: 4120

MILITARY

ASDF EXPECTED TO ADOPT IMPROVED V-107 FOR H-X

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 pp 6-7

[Text]

The ASDF is shortly expected to select an improved version of the KHI V-107 helicopter as the H-X rescue helicopter to replace the V-107.

Although some quarters have indicated the possibility of a larger helicopter being adopted as the H-X, the improved V-107 can meet the ASDF's H-X requirements. Furthermore, the improved version can carry out smooth joint operation with existing V-107s and make it easier for the ASDF to shift to a new type.

If the improved V-107 is finally selected, basic design and fabrication of the improved version are expected to come in FY 1982 and 1983 after detailed research in FY 1981.

The ASDF plans to procure 13 rescue helicopters under the FY 1980-84 Medium-Term Defense Program (MTDP). Of them, six are V-107s of the current version for procurement in the first half of the MTDP. They will replace S-62 helicopters. The remaining seven helicopters will be H-X's to replace older V-107s. The ASDF request for the new versions is expected to begin in FY 1983.

CSO: 4120

MILITARY

JDA TO ORDER BASIC DESIGN OF C-1 FOR ECM FROM KHI

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 7

[Text]

The JDA's Central Procurement Office will place a ¥197,858,000 order soon with KHI for a basic design of a modified C-1 transport to be equipped with the XJ/ALQ-5 electronic countermeasure (ECM) system, which has been developed by MELCO for ASDF ECM training against ground control radar and guidance radar for the SAM.

The basic design will be delivered to the JDA in March 1981 for modification of a C-1 from FY 1981 to 1983. The ASDF has already requested funds for the C-1 modification program. In the second half of FY 1981, KHI will prepare necessary machine tools after detailed design, and then, manufacturing of components will start. Full-scale modification will be carried out from the third quarter of FY 1982 to the fourth quarter. The modified C-1 will be delivered to the ASDF in the second half of FY 1983 after flight tests.

The ASDF will continue technical tests for the modified C-1 with the ECM system until FY 1984. Full-scale operation will start in FY 1985.

Fabrication of the XJ/ALQ-5 ECM system is to begin in the current fiscal year. It will be delivered to KHI by the third quarter of FY 1982 to meet the C-1 modification schedule.

CSO: 4120

MILITARY

CIVILIAN SPECIALISTS TO STUDY TAN-SAM ISSUE

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 p 5

[Text]

The Defense Agency last week inaugurated a six-member civilian group for study of the domestically developed short-range surface-to-air missile coded here as the Tan-SAM for the Japanese Self-Defense Forces.

The members of the group include: Makoto Kikuchi, Director of Sony Central Institute; Tadao Kusumi, a military affairs commentator; Toshihiko Kubo, a consultant of Hitachi Ltd.; Hideo Shima, a consultant of the National Space Development Agency of Japan (NASDA); Shun Takeda, Science Research Officer at the National Aerospace Laboratory (NAL) and Yoshimitsu Takeyasu, Chairman of the New Technology Development Agency. The first meeting of the group was held in Tokyo last Wednesday.

Keigo Ouchi, a Democratic Socialist Party (DSP) member of the House of Representatives, raised questions at the House Budget Committee October 11 to the effect that the all-weather Roland missile developed by Euromissile and also being adopted by the US Forces is superior to the infrared-ray homing Japanese Tan-SAM.

The Defense Agency had earlier decided on adoption of the Tan-SAM for both the GSDF and the ASDF for field units and airbase support squadrons respectively, and requested funds for a total of ten units in the FY 1981 defense budget draft.

At the top-level meeting between Prime Minister Zenko Suzuki and DSP Chairman Ryosaku Sasaki on Oct. 24, Suzuki promised that the government would study the Tan-SAM issue before the budget draft is presented to the Diet toward the end of the year. The civilian group was set up as a result of discussions held between Kiichi Miyazawa, Chief Cabinet Secretary, and Joji Omura, State Minister for Defense, early last week.

Omura, however, told reporters that it was unanimously agreed by defense leaders the Tan-SAM would be most suitable for the Japanese services. He added that the civilian group was inaugurated so that the agency would have an opportunity to explain the missile and to hear opinions from civil circles in order to "wipe out misgivings about the Tan-SAM among the general public."

CSO: 4120

NEW TERMINAL TRANSPORT HELICOPTER SELECTION IN FY81

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 p 6

[Text]

The Air Self-Defense Force (ASDF) plans to select a new heavy-lift terminal transport helicopter in FY 1981 for procurement from FY 1982, following introduction of Lockheed C-130 transports for long-range transport.

The ASDF hopes to procure about 10 units of the new helicopters in the first stage to restructure transport squadrons along with C-130s.

Terminal transport helicopters will be used to carry heavy equipment, which C-1s and C-130s will carry to bases, to remote radar sites and other places without airports. At present, V-107 rescue helicopters are used for these missions.

A helicopter larger than the V-107 is expected to be selected to carry a mobile three dimensional radar weighing five tons, although the ASDF has yet to decide whether to use the new helicopter for this purpose. In preparing for the selection, it will study personnel and equipment needed for transportation in comparison with the V-107.

The 10 first-stage helicopters will be two each for the Northern, Central, Western and Southwestern ASDF areas, and two for reserves. In the second stage, each ASDF regions will receive three. Smaller helicopters will be procured if necessary.

CSO: 4120

MSDF P-3C PRODUCTION PROGRAM-PROGRESS REPORT

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 6-7

[Text]

Under the MSDF's program for domestic production of avionics systems for P-3C antisubmarine warfare (ASW) aircraft, Shimadzu Seisakusho Ltd. has been selected to manufacture the CAE Industries' ASA-64A magnetic detection signal processor and Emerson Electric's RO-32/ASQ magnetic detection recorder for 10 P-3Cs covered by the second MSDF contract in FY 1980 and subsequent P-3Cs.

It has already signed a licensing contract with CAE Industries on the ASA-64A. Government approval is expected by the end of November.

On the RO-32/ASQ, Shimadzu has a contract with Emerson Electric to produce the system for MSDF P-2J ASW aircraft. This contract will be partially revised for the switch to P-3Cs.

Shimadzu will also be in charge of production of three other P-3C avionics items, including the signal converter of EPSCO, for eight aircraft covered by the first P-3C contract in FY 1978. In all it will produce a total of five P-3C avionics items.

Toyo Communication Equipment Co. has been designated to manufacture the APX-76 IFF interrogator and the APX-72 IFF responder of Hazeltine Corp. for the second and subsequent P-3C contracts.

It has concluded negotiations with Hazeltine on an APX-72 responder licensing contract. It will apply for government approval after receiving its contract from the US company. Approval is expected by the end of November.

No new contract on the APX-76 interrogator will be necessary because it has a contract with Hazeltine to produce the intertogator for F-15 fighters.

CSO: 4120

MILITARY

BRIEFS

THREE 155MM HOWITZER CANDIDATES--The GSDF is evaluating three candidates for its new tractor-towed 155mm howitzer to be procured from FY 1984. They are the Britain-West Germany-Italy FH-70, the Swedish FH-77B and the American M-198. Main evaluation subjects include firing, mobility and controllability. The GSDF is also studying a plan of the Technical R&D Institute (TR&DI) to develop a new self-propelled howitzer using the gun barrel of the new towed 155mm howitzer. This development program will start in FY 1982 with standardization planned for FY 1986. The new towed 155mm howitzers are designed to replace the current 105mm and 155mm versions for divisional artillery units. The first seven units will be procured for training in FY 1984. For artillery units of GSDF regional armies, self-propelled 203mm howitzers will be introduced. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 8]

CSO: 4120

ECONOMIC

KHI TO RENEW V-107 LICENSING CONTRACT WITH BOEING VERTOL

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 pp 3-4

[Text]

Kawasaki Heavy Industries (KHI) and Boeing Vertol Co. have agreed to extend a licensing contract on the V-107 helicopter by another 10 years until Dec. 5, 1990.

The agreement came during negotiations held in Tokyo Oct. 31, although they had been at odds over the price of Boeing Vertol's technical data and services to be given to KHI for the next 10 years. KHI is to apply for government approval of the renewed contract in the middle of November.

The contract on KHI's license production of the V-107 was originally signed in 1960 for a period from Dec. 6, 1960 to Dec. 5, 1970 and renewed in 1970. The renewed contract expires Dec. 5, 1980.

Considering future demand for the V-107 helicopters, KHI decided to renew the licensing contract again. It expects demand from the Japanese Defense Agency (JDA) for new versions of the V-107 because this helicopter is a promising candidate for the H-X rescue helicopter of the Air Self-Defense Force (ASDF). KHI also places expectations on future exports. Furthermore, it will have to continue production of spare parts for V-107s in operation.

Until March 1980, KHI had produced 123 V-107-IIs and V-107-IIAs--58 for the Ground Self-Defense Force (GSDF), nine for the Maritime Self-Defense Force (MSDF), 28 for the ASDF and 28 for export and domestic commercial and other civil customers.

At present, it is manufacturing one unit for the GSDF and two units for the ASDF.

CSO: 4120

CONTRACT WITH EDMAC ON R-1651 APPROVED

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 4

[Text]

The Japanese government has approved Japan Radio Co.'s contract with Edmac Associates Inc. on license production of the R-1651 sonobouy indicator for the MSDF P-3C anti-submarine warfare (ASW) aircraft.

Japan Radio has been selected to produce the sobobouy indicators for 10 P-3Cs covered by the second MSDF contract to be concluded under the FY 1980 budget. Its license production is also to cover P-3Cs after the second contract.

The company also has another contract with Edmac on license production of the ARR-76 sonobuoy receivers for all of the P-3Cs for the MSDF, including eight aircraft covered by the first contract.

Japan Radio will start production of the sonobuoy indicators around March 1980 when the JDA's Central Procurement Office is expected to place an order.

It has enough sonobuoy indicator technology to produce the new indicators with only technical documents provided by Edmac since it has so far manufactured about 130 NR-86 sonobuoy indicators for MSDF P-2Js. It should not have to send engineers to Edmac for training, according to informed sources.

CSO: 4120

MELCO PREPARING FOR AIM-7F AAM PRODUCTION

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 pp 4-5

[Text]

Mitsubishi Electric Corp. (MELCO) is receiving technical documents from Raytheon Co. in preparation for license production of AIM-7F air-to-air missiles (AAM) for ASDF F-15 fighters starting before the end of next March when the JDA will place an order for the missiles. The firm is the prime contractor for AIM-7F production.

It has already selected subcontractors and been preparing equipment for the missile production.

The JDA is to procure 87 AIM-7F missiles under the FY 1980 budget. Of them, 67 will be covered by MELCO's knockdown assembly production. Its full-scale local production will cover the remaining 20 units and about 330 units for procurement in FY 1981, although the local production ratio is targeted at 85 percent even for that stage.

Most of the subcontractors are the same as those for production of AIM-7E AAMs for ASDF F-4EJ fighters. Asahi Chemical Industry Co. is assigned to take charge of boosters. Two new subcontractors are Japan Storage Battery Co. for batteries and New Japan Radio Co. for solid state local oscillators (SSLO). These components are not incorporated into the AIM-7Es. The two firms have so far manufactured the above components for Hawk surface-to-air missiles.

MELCO's AIM-7E production for F-4EJs will finish in FY 1981 with output since FY 1971 reaching about 1,220 units. It is now manufacturing AIM-7Es covered by the final contract which the JDA concluded under the FY 1979 budget.

CSO: 4120

INDUSTRY LEADERS IN EUROPE FOR TALKS WITH AIRBUS, FOKKER

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 2-3

[Text]

Iwao Shibuya, Managing Director of Fuji Heavy Industries Ltd. and Chairman of the Special Committee on the YXX at the Society of Japanese Aerospace Companies (SJAC), Teruaki Yamada, Managing Director of Kawasaki Heavy Industries Ltd., and Kenji Uchino, Vice Chairman of the Civil Transport Development Corp., left for Europe last week for talks with leaders of Airbus Industrie and Fokker Aircraft Co. on possible collaboration in joint development of a new medium size passenger aircraft coded here as the YXX.

Shibuya and his group were scheduled to first visit Toulouse and expected to explain to top management of Airbus Industrie Japan's basic stance toward joint development of the YXX class aircraft. Airbus Industrie has been asking Japan to join their SA1/2 single-aisle aircraft development project as risk-sharing partner. When SJAC leaders including Chairman Eiichi Ohara visited Toulouse last April, the European consortium requested Japan to conduct a joint survey on a non-commitment basis.

After the meeting in Toulouse, they are scheduled to visit Schiphol for talks with F. Swarttouw and other top executives of Fokker Aircraft Co. Swarttouw proposed to the Japanese aerospace industry toward the end of September for its participation in joint development and production of new passenger jet based on their F-29 project with Boeing on an equal basis. Swarttouw was in Seattle, Washington, early last week for discussions with Boeing on the F-29 proposal prior to meeting the Japanese industry leaders in Amsterdam.

*YXX may become larger

Preliminary market studies conducted by individual Japanese aerospace manufacturers indicate that the YXX aircraft which Japan plans to develop in collaboration with a foreign manufacturer(s) now appears to be somewhat larger than what the Japanese originally sought. Indications are that it will have accommodations for 150 - 160 passengers, instead of a 130-seater as conceived earlier, industry sources report.

This is due to a consideration that Boeing would most probably get into the new 130-seat class passenger aircraft market sooner or later. In order to avoid such competition, an increasing number of industry leaders are reportedly in favor of developing an aircraft larger than the 737 and smaller than the 757. The 150 - 160 seater may be the right size of the YXX, they opine.

CSO: 4120

ECONOMIC

SJAC ASKS LDP TO SUPPORT BUDGET FOR STOL PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 3-4

[Text]

Eiichi Ohara, Chairman of the Society of Japanese Aerospace Companies (SJAC), at a recent meeting with the Science and Technology Division of the Liberal-Democratic Party's Policy Affairs Research Council asked the party to support budgetary requests for FY 1981 on research and development of an experimental STOL (short takeoff and landing) aircraft.

Regarding the STOL project, the Science & Technology Agency has requested ¥4,491 million in the next fiscal year and ¥5,829 million in follow-on disbursement. In addition, the Agency of Industrial Science and Technology, Ministry of International Trade and Industry (MITI), has requested ¥2,010 million for development of the FJR fan jet engine to be mounted on the STOL aircraft.

Ohara said the fan jet STOL aircraft project forms an important part of the Japanese aircraft industry's efforts to establish independent technology and increase its technical development capability.

The STOL project was launched in 1977 by the National Aerospace Laboratory (NAL) of the Science & Technology Agency and fabrication of an experimental STOL aircraft started in FY 1979, he added.

Ohara pointed out the experimental aircraft, based on the domestically-developed C-1 transport, is to use the FJR-710 engine being developed by the MITI agency. Thus, he said, the STOL project will use only domestic technology, contributing to development of Japan's aircraft technology.

He also noted recent flight frequencies indicate a possibility that fan jet STOL aircraft will become necessary for efficient utilization of airports and reduction of aircraft noise in future.

To meet future demand, he said, Japan must complete the experimental STOL aircraft by FY 1983 as planned for flight tests to confirm STOL technology.

So far, he noted, the government has approved ¥9,400 million of follow-disbursement and ¥3,600 million in actual appropriations for the STOL project costing a total of about ¥20,000 million.

SJAC, placing great expectations on the project, has provided maximum cooperation, he added.

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ECONOMIC

BRIEFS

RJ500 FUEL SYSTEM CONTRACTOR SELECTION--Rolls-Royce and Japanese Aero Engines Ltd., a Japanese-British joint venture for development of the RJ500 aero engine, will select contractors for manufacture of the engine's fuel system by the end of November, according to Japanese aircraft industry sources. An order for hydraulic devices, important components of the system, will be awarded to Hamilton-Dowty Fuel Systems, a joint British-American company, the sources said. IHI will also take part in fabrication of the system. For an electronics order, Hamilton Standard of the United States and Dowty and Smiths Industries Ltd. of Britain are competing, the sources said. No manufacturer has been named yet for assembling the two systems, they said. Orders for the fuel system will be handled by IHI on behalf of companies participating in the RJ500 program. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 p 4]

CSO: 4120

EXPERTS DISCUSS RESEARCH, DEVELOPMENT OF ELECTRONIC WEAPONS IN EIGHTIES

Tokyo GUNJI KENKYU in Japanese Oct 80 pp 106-124

[Text] Participants:

Host: from Journal GUNJI KENKYU
Wada: Chief, Internal Equipment Bureaus of Defense Agency
Ohmori: Director, Technical Research and Development Institute of Defense Agency
Abe: Director, First Electronic Department of Mitsubishi Electric Corporation
Tanaka: Executive, Nippon Electric Co
Matsuda: Acting Director, Defense Machinery and Equipment Headquarters of Fujitsu Limited
Yoshida: Assistant Operational Director, Radio Machinery and Equipment Headquarters, and Director, Komukai Plant of Toshiba Corporation
Morimoto: Director, Defense Communications Department of Hitachi Ltd

Present State of Electronic Weapons

Host: Thank you very much for coming to participate in the discussion today. America fought a very long and dragged out war in Vietnam, which was considered utterly wasteful and unrewarding. However, it is noteworthy that new weapons were developed in the course of the war. The electronic laser is said to have had a very revolutionary effect on the latest weapon systems. Today, therefore, I would like to discuss the subjects related to electronic weapons.

First of all, to begin the discussion, I would like to ask Mr Wada, Chief of the Equipment Bureaus of the Defense Agency to discuss the status and future prospects of equipping the armed forces with modern weapons. Subsequently, I would like to ask Mr Ohmori, director of the Technical Research and Development Institute to tell us about your developmental research and its future.

Wada: I have frequently talked about the basic approach to research and development in the Defense Agency at various occasions. Let me reiterate it briefly for you. We consider it most essential to research and develop by our own hands equipment required for defense and considered to be a basic need of our country. Especially, we hope to develop equipment suitable for our land and conditions.

This point is very important for the maintenance and supply of our equipment. Furthermore, research and development of our own is necessary to maintain the capacity for improvement, a kind of growth potential, and we believe that the foundation of our defense power is built by such competence for technical development.

I would like to mention in particular that without ourselves putting our hands into development we cannot even properly evaluate or we will not be in a position to be able to negotiate to the full extent with our counterpart if and when we decide to import most advanced foreign technologies from America or other advanced nations who exert themselves to develop their equipment. These worries may have some grounds. Therefore, the development of equipment is crucial for one thing, in order to develop by ourselves what we really want that matches our land and conditions and insures easy maintenance and smooth supply of equipment, and for another, in order to provide ourselves with the ability to evaluate foreign import technologies with adequate bargaining power.

Successive directors of the Defense Agency have fully recognized the importance of the matters I have just mentioned. Fortunately, the budget for fiscal 1980's research and development is slightly enlarged.

Roughly speaking, the Defense Agency attended to the maintenance of defense capability, to use a common word, by hand to mouth methods. Actually, only a bare minimum treatment has been administered in the past. Consequently, I suspect this to be true that a sufficient budget has not been allocated for a basic program such as research and development.

Frankly, the American budget for research and development is, I believe, 2 trillion 680 billion yen while the Japanese budget for the same is 26 billion 800 million yen. Let me be corrected later if my figures are wrong. The Japanese budget is exactly 1 percent of the American budget. We know this gap is too discouraging and are aware of the need to improve the situation a lot better in this respect.

How to make changes will be controversial, and I would rather not discuss it now but leave it for a later opportunity. Basically, all what I said will summarize the present state of the matter.

Host: I understand there is a Japan-U.S. agreement to move up considerably the estimated medium term operations. In fiscal 1980, will an increase in the equipment expense related budget be seen immediately?

Wada: First, let me correct about the plan to move up the medium term operations. The U.S. asked Japan to give serious consideration to advancing certain programs within the Japanese Government by 1 year. In response to this request, the late prime minister Ohira did not directly touch the subject but implied in effect that Japan would seriously examine what she could do for the enhancement of defense as a member of the Western alliance.

What will then actually happen to the medium term operations will depend on what's what of the fiscal 1981 budget. Just yesterday, the ordinary cabinet council decided to give special treatment status for defense expenses. Under this order, presently the operations estimate is zealously being piled up. How this effort will turn out, first of all, in the fiscal 1981 budget will answer the question, as you see.

Host: Is it for sure that the equipment expenses will be sizably beefed-up?

Wada: That's what I hope. On one hand, however, financial reconstruction is the primary objective of this cabinet. According to what I heard about the results of the meeting between Director General Kimura of the Defense Agency and Minister Watanabe of the Ministry of Finance, as you have probably read in newspapers, they have agreed to give special treatment to defense expenses in the light of the three essential pillars, financial reconstruction, facilitation of the defense capability and coordination of Japan-U.S. relations.

Troubles Associated With Being Responsible For the Development of Electronic Weapons

Host: Mr Ohmori, we assume you are conducting well-organized research and development utilizing an ample budget and human resources of national stature in the Defense Agency. Would you tell us about the present condition and the future prospects?

Ohmori: Incidentally, the services rendered by us, the Technical Research and Development Institute, are not limited to the electronic field. The research and development related budget of the Defense Agency is currently slightly an upward move. This is the result of our last few years' counter efforts to reverse the trend of the slowly impoverished research and development budget up to recent years.

Generally speaking, our research and development is tailored to the needs of the users. When the needs of the users change due to the social and economic conditions of a specific time, this change is also reflected directly upon our work. Well, some may say take things as they come. Technology, however, requires continuity for it to be meaningful. We realized off-and-on research and development effort is not truly fruitful. We must ourselves safeguard the continuity of projects. We have agreed to conduct large scale research which will eventually lead to proposals that bring forth technologies, especially when needs of the users are low. We named it "proposition study."

In short, with the blessing of everyone, we shared our part in an attempt to increase research and development expenses. With this and that, it is gradually climbing up.

Referring to the electronic weapons in particular, the topic of today's discussion, first, I would like to make a minor correction. A little while ago, the host of this discussion introduced me by saying that my professional training was given in the Third Research Laboratory which is known as a "mecca" of electronics. That statement is slightly misleading, and I must say the "mecca" of electronics is the First Research Laboratory as far as the Technical Research and Development Institute of the Defense Agency is concerned.

However, as we will be discussing it sooner or later, our research and development is not singly devoted to electronics. Electronic research and development will be materialized without fail as future weapons or basic softwares demanded by the users. If we look at electronics from this aspect, 60-70 percent of missile expenses are, pushing the argument to its extreme, accounted for by electronic expenses. The expenses of the next generation of aircraft will also include 30 percent electronic related expenses. With these all calculated, the present electronic related expenses is already estimated to run up to 50 percent. The missiles and aircraft handled at the Third Research Laboratory just mentioned are surely key products in terms of the cost, and the electronic works come into our hands through these channels.

Under these systems, it will not be overstating to affirm that the progress of future modern weapons will never be achieved without electronics. Leaving pertinent details for later, first, let me state that when increases in the budget and personnel are requested one-third to one-half of the increase is relegated for electronic areas although it is not that often that we demand a budget intentionally in the name of electronics.

Even at present, more than 50 percent of the staff newly employed every year up to a number limit at our laboratory are those who have something to do with electronics. With this in perspective, it seems we have no choice but work and push for the advancement of electronic weapons in the future research and development.

Host: You have just told us that electronic weapons amount to 50 percent of weapon development. What about the percentage of equipment expenses relative to the defense budget, and also the percentage of research expenses for the development in that budget?

Wada: Well, let me quote some of the related figures. The most important point is that the percentage of equipment expenses is slightly improving annually. It is true that the equipment expenses was often criticized to be very meager a few years ago. I believe it was 1976 when the equipment expenses became lower than 20 percent. We were then also well aware of the grave implication and closely watched the way it went.

Combining the three expenses, equipment purchasing expenses, research and development expenses and facility maintenance expenses as capital expenditures, it was the lowest, 19.6 percent, in fiscal 1976 as I have just mentioned. Then, it changed to 20.7 in fiscal 1977, 20.5 in fiscal 1978, 22.6 in fiscal 1979 and 24.4 in fiscal 1980. Compared to the period marked by 19.6, it has already improved 4.8 percent points, 20 percent by percentage. Under the circumstance, I must say the trend of expenditure is basically becoming healthier.

Host: What about development expenses?

Wada: I can tell you separately about development expenses. It was 1.21 percent in fiscal 1976, 1.25 percent in fiscal 1977, 1.24 percent in fiscal 1978, 1.28 percent in fiscal 1979 and 1.29 percent in fiscal 1980. 1.21 percent of the fiscal 1976 was also the lowest.

Host: Do you have any idea what it will be in fiscal 1981?

Wada: I am hoping somehow to improve the figure in fiscal 1981 and thereafter. However, at this stage, I cannot carelessly give you any forecast since we are in the midst of compiling the budget. I assure you the Equipment Bureau is working hard for this and thinking of pushing it up to 1.5 percent if possible.

Host: 20 percent is not necessarily a small sum for a military that has already been established, but it sounds too inadequate for a developing military. Especially, less than 2 percent for development expenses seems....

Wada: You are quite right. Even in comparison to other nations, it is certainly inadequate. Briefly referring to the percentage of research and development, in fiscal 1979, Japan was 1.28 percent whereas America was 10.61 percent. England was 13.6 percent, West Germany 4.95 percent and France 10.15 percent. Except for West Germany which was slightly low, all the others had sizable allocations. Japan was more or less one-tenth of the others.

As I have mentioned at the beginning, the Japanese research and development budget is extremely slim. Historically, Japan has been equipped with materials supplied by America. This practice has been very inexpensive, and still leaves a trail However, it will be necessary in the future with a prospective insight to develop equipment in line with a clear vision as to what is really in demand. Also, I think it is necessary to have some setting for evaluation of the research and development results.

Yet, this is not the problem of the Defense Agency alone. Frankly, private industries have depended on imported technologies for a long time after the war. The import dependency rate was overwhelmingly high. Only recently they began to invest their time and money heavily on development. Still, I assume, if technology imports and exports are balanced, the percentage of imports will be predominant. However, speaking in terms of the monetary wind velocity, that is, contract base, at last the technology exports, maybe it is better to say technology sales, in other words, giving of technology has overridden receiving of technology. Still, as I have said before, on the basis of income and outlay, they are numerically in the red. Lack of emphasis on technical development is not a unique problem of the Defense Agency, but it fundamentally, in some aspects, reflects the tendency of the technical side in Japan as a whole, in a broader sense, the tendency of the economy and society of integral Japan. Adding to this backdrop, the tendency of the Defense Agency also reflects the particular circumstances at the starting of the agency, I am sure.

Electronic Technology Is Abreast With Other Nations

Host: Development of industries in Japan since the Meiji era has been led by the initiative of the government. Especially in the field of production and development of weapons, the only customer in sight was the government. Differences or disparities in thinking between the people and the government have been inevitable, even among those closely involved in the actual field concerned. I am sure there are various questionable points or disparate points even in matters which have not been revealed up to now. I would like you to tell us your opinions relating to these points one by one. Mr Abe of Mitsubishi, could you start, first?

Abe: We, who are involved in defense contracts, are very glad to see mass communications and others look right into the issues related to the defense of our country due to the changes in the recent international or internal conditions. I believe Chief Wada and Director Ohmori, who are presiding over this talk today, are quite busy to cope with these changes. It is really a welcome change for us who engage in the defense related works to witness a coming of a time when we can deal with our tasks based upon the national consensus formed by taking defense issues directly and discussing them openly.

First, let me clarify where we stand. We are in charge of the electronic field of defense materials. We hear that equipment modernization is projected according to the Post 4th Defense Buildup Plan or Medium Term Operations Estimate. As director Ohmori mentioned before, modernization and electronization seem to be the target of the Defense Agency, and we are hopeful that we can be more frequently called upon for our services.

On one hand, we hear that the Defense Agency is intending to raise the defense budget in correspondence to the recent heavy demand for defense efforts suitable to the national power. On the other hand, financial restrictions must be giving Chief Wada a big headache when he tries to distribute the defense budget.

Defense materials are largely divided into front equipment and rear equipment. Electronic tradesmen like us handle predominantly those that belong to rear equipment although those that belong to front equipment are not entirely excluded.

When defense efforts are to be visualized, efforts are apt to be focussed only on the front equipment due to the budget limit. We are afraid that the budget for rear equipment which concerns us electronic tradesmen will be considerably squeezed. We feel helpless that electronic tradesmen are always left behind, and we appeal to your good offices to safeguard us from such a disposition in the light of the fact that the world has entered the era of electronization.

Speaking of development, as we have just heard, the budget is certainly increasing slowly every year. However, among general business enterprises, there is a conventional understanding that a company will be left behind and will not prosper unless at least 3-5 percent of the total annual sales is invested for the development of the business. The Defense Agency provides only little more than 1 percent of the total budget for the development. That means, the agency is a risky company which is faced with potential bankruptcy in 10 years.

On the other hand, looking at the developmental investment of the corporations each of us represent today, I am positive that our companies invest for self-development much more than the sum of some 20 billion yen which the Defense Agency budgets annually for the time being. I feel it abnormal that the developmental budget of the Defense Agency is smaller than that of a private corporation. It is urged that the budget should be increased at least to 3 percent as soon as possible.

Development can be divided into two categories, development of weapons and development of basic technology. We, in the private sector, perceive that the Defense Agency invests very little especially for basic technology. Japan before the war used to, and other nations practically also rely on the military to be in charge of the development of unknown basic technologies. This delegation of the task stems from the characteristic of the military which demands weapons with the best technical know-how.

The reason for this military initiative may be found in that a nation can possess weapons superior to those in other nations only after she has invested and succeeded in projects with unfavorable odds of success. This enables the nation to keep more defense capability with less weapons.

Nonetheless, at present, the Defense Agency focuses on the development of weapons, maybe due to the limited budget for development. The agency hardly engages in the development of essential basic technologies, but relies on the development by the private sector. Under the circumstances, it is impossible to develop most advanced weapons. It is hoped that the future defense budget increase will be also invested in the development of basic technologies.

There is one more thing to add. We are very pleased to know that the developmental investment by the private sector can be of service, and would like to ask the Defense Agency to let us know by some means your long term prospect for development so that it will guide us as to what kind of defense projects are to be developed by the industries themselves. I believe the united impact of the Defense Agency's developmental investment and the corporative developmental investment will facilitate effective development. I am sure you are entertaining many good ideas. I also believe it will be very useful for the future of the defense of Japan if you, the Defense Agency, could disclose to us your vision of the future direction and prospect in the area of defense in 10 years, 15 years or 20 years.

Host: Is Mitsubishi working on F104, F4, F15 and Nike and Hawk?

Abe: Not Nike, but Sparrow.

Host: Does your other work relate to naval vessels?

Abe: Yes.

Host: In addition to that, tanks such as model 74 tank....

Abe: Also, FCS of F1 and ECM.

Let me tell you a little more about where we stand. I have been involved in this defense business for over 20 years. When I went on observation trips to the U.S. in 1955 to 1956 officiated by the technical tie-up with American companies, I felt a serious gap between Japanese and American technologies, a gap we might have never been able to fill. However, in 1965-1975, I was confident that we could catch up if we learned just a little more. Since 1975, I cannot believe why we first felt it so difficult to do the job.

Since the Japanese electronic technology is overtaking others at such a whirling pace like this, I am afraid in 10 years we will have nothing we can import from abroad.

As evidence of this trend, lately foreign technology exporters are talking about very expensive license fees. In the old days, when we were so far behind, they did not need to worry about selling the technologies. Recently, however, they like to charge us a lot in anticipation that we will become too competitive as soon as they sign out the licenses. Technical development cannot be achieved in a year or two. It takes 10 years or 20 years. Now, the time has come for us to develop our own technologies, and to start investing in this area, isn't this true?

Taking Too Long to Realize Electronic Equipment

Host: Mr Tanaka, I often associate Nippon Electric Company, Limited with the BADGE system. Since you handle very large projects, you must have plenty of headaches.

Tanaka: Yes, the present BADGE was assigned to us. We are really hoping to be able to offer our services when this BADGE will be renewed.

Host: If you have anything to add to the explanations given by the representative from Mitsubishi Electric Corporation....

Tanaka: Mr Abe has just given us a general idea. He is right. Of course, it is our own duty to protect Japan. Consensus is lately turning largely to this point, and the presence of the Self-Defense Force is said to have gained wider support. We are therefore prospecting and hoping that the future defense expenses would be enlarged not promptly but maybe at least gradually.

Well, the increase of defense expenses is naturally linked to the modernization of equipment. As previously mentioned, we are hopeful that electronics will be of great service for modernization, and in this respect, we are very anxious to cooperate with the Defense Agency.

As mentioned previously, comparing ourselves with America after the war, we felt our technologies were 10 to 20 years behind, which led us to conduct our business using imported technologies. Later on, in some fields, we went ahead. Nevertheless, as far as defense equipment is concerned, it seems to be a fact that Japan is generally far behind in progress due to the small sum which has been invested so far by the nation as a whole. As figures given before, 10 percent of the defense expenses are spent for research and development in the U.S., which is approximately the same as the total budget of the Japanese Defense Agency. As Chief Wada mentioned before, although technical development by the private sector is also in demand, we are hoping that the Defense Agency will take an active interest in research and development in order to stress the development of home-made weapons.

Another point I want to make regarding research and development is, although I am aware that the lack of defense budget is an obstacle, that it takes too long from the time research and development starts to the actual production of weapons. Sometimes it takes 10 years. Under such circumstances, technologies in the electronic field are not idle but advance far ahead while we are waiting for the product to be produced. How to deal with this time lag is one problem we must eventually solve.

Utilization of Electronic Technologies Developed by Private Sector

Host: Mr Matsuda, what kind of projects does Fujitsu Limited handle now?

Matsuda: Those related to land communications and other electronic warfare, and loading computers. Also, the Tactical Support Center (T.S.C.) of fiscal 1979 was assigned to us, which is associated with submarine surveillance aircraft.

Host: Well, there seems not much differences between what you do and what Mitsubish does....

Matsuda: That's true. I am sorry (chuckling).

Host: Do you also have some developmental works?

Matsuda: Yes, we have various developmental works, for instance, infrared weapons. We hope to get more contracts in this field, too.

Host: Not that it began after Director Ohmori took his office at the Technical Research and Development Institute, but the developmental budget of the Defense Agency is extremely all-around and thinly spread, which results in long deferred or delayed development. Besides, this all-around policy does not seem to include basic research. What do you think of this, do you have anything in mind in line with this point?

Matsuda: Well, then, may I say just a little in that context and also in addition to what you have discussed previously. I may repeat what you two have said already, but what we are thinking of is a kind of basic research. When reviewing the field of electronics, there are some differences between general electronics and electronics for weapons. When you look beyond these differences, there appears an element of basic research. I believe this is after all the field only the Defense Agency can pick up and pursue. Also, from a certain point of view, this task may not require that much money, I went too far in saying this, but I couldn't avoid using a totally contradictory expression. One of the points I wanted to note is that analytical and evaluational studies are very effective as a stimulant, although research for producing materials is also important.

Incidentally, those imported from abroad, previously mentioned by Chief Wada, are unmistakably weapons. I will not complain about introducing these sophisticated weapons directly into our equipment system. However, isn't it recommendable for researchers and engineers in development to examine the imports with open minds, for a period for test and evaluation? If this test and evaluation is conducted from an angle of research and development, an angle different from operational evaluation given by the operators, the difference between the electronics for weapons and general electronics will be largely clarified. The second point I want to bring out is that the clarification of a certain element peculiar to weapons may work in a sense as an accelerator for the promotion of efficiency.

Thirdly, an unnecessary remark that I should have left unsaid. I believe, although repetitious, what counts is the utilization of the electronic accomplishments in general aside from the defense field. It is easy to say but difficult to practice when one tries to find an effective utilization of what has already been developed unless one tries really hard. Even within the manufacturers who have achieved electronic developments, the utilization of the developments is not so easy. Needless to say, it will be very exhausting to utilize all of these enormous amounts of accomplishments by matching them efficiently.

For this kind of task, a great deal of effort is required. It is not the matter of money, but it is after all the wisdom and effort of men that counts. To this effect, I am sorry to be frank with you, there is a definite line drawn between the government and the people, which does not allow a relationship evident between makers and users. I feel strongly that the civilians must make more efforts to establish a form of contact as seen between makers and users, and I am hoping that the public officers also will guide us into this goal.

Parallel Development of Alternatives for Shortening of Developmental Period

Host: Toshiba Corporation has been a contractor of the Defense Agency for over 10 years, hasn't it? I am sure you have some issues to talk about through your experiences to date.

Yoshida: Well, I heard you said that the private sector spends more money than the Defense Agency currently allocates for developmental expenses. If the government has enough money to pay us even when we deal only with development, as in the U.S., it is really ideal. In reality, our status will not be brought up to that perfection over night, just as the saying, "agree in general but disagree in detail." That implies that the status quo will be slowly and gradually changed for a while, and this style is the only practical way.

As discussed before, development related to defense requires a very long period of time, for instance, 5 or 10 years. As the chief of the Equipment Bureau stated, the government will guide us according to its vision of development and we are only to follow it faithfully through. However, speaking from our side, we must tie-up our best men for long periods of time to do the job since the engineers who deal with the defense-related development must be able to handle the most advanced technologies. This means we must make a great deal of human and operational investments during this period.

In order to safeguard the young men who devoted their youth to such work from moral frustrations in the later years, we request your leadership to see to it that the results of the efforts will produce fruitful weapons. If there is a doubt whether or not their efforts will be useful later, they may be demoralized. Also, speaking from the viewpoint of business operations, I am sorry to say, the fund granted is not enough to cover all the necessary expenses required for development. I am hoping that some considerations will be given to such risks involved.

Additionally, I believe we are still in need of purchasing some machine parts from the U.S. for a while whether or not we like to do so. Lately, however, the machine parts bought from abroad at some expense are discriminated against domestically developed products only because they are slightly older and the two are not combined but separately treated. This practice seems to be a waste of money paid for the imports. Some of them, although they may not be that much technically advanced compared to our products, have lots of good features as weapons, for example, they may not be wrecked even when handled by brute force. The point is how this time we are going to feed back these features to our development. I am certain proper assimilation of human engineering and tactical know-how will give us many good points for our development.

As an effort to encourage absorption of foreign know-how, I suppose you also practice this in government, but we, who engage in the defense production in private corporations, once in a while rotate some of our staffs in the development section with the staff in the production of weapons in order to standardize the knowledge, of which of course does not mean to average out the level of all, but it is meant to be useful for the development of better machine parts by assimilating good points.

One more problem is the lengthy developmental period which may last as long as 5 to 10 years. How to shorten this time lag is a big question. According to the customary methods, it takes so long to comply with a series of established procedures which comprise of initial trial model making, second trial model making, technical tests, finally, utility tests, and in addition, regularization. In order to cope with this, just as in the story of Yoshitsune and Kagetoki Kajiwara who installed oars both on the stern and the bow to accommodate two-way maneuverability, it may be helpful for our country as a whole if the government makes allowances for parallel development and change over to alternatives immediately after problems are detected with the initial project to reach an earlier completion of a system.

I believe, in addition to the conventional straight forward operation, applicational actions thoughtfully taken for some projects which may benefit from them, will shorten the developmental period.

Research and Development in Softwares Recommended

Host: I guess Hitachi Limited is also one of the older faces who receive contracts from the Defense Agency. Do you mind telling us your opinion?

Morimoto: We wholeheartedly welcome the ideas presented so far by the Defense Agency in this round table talk. The key issues of the talk are, for one thing, the enrichment of technologies original to Japan, which will be more inclined to electronization; for another, the research on the Technical Research and Development Institute's own theme, that is, the introduction of "Seeds Orient" research. Our business policy has been to "kindle small but everlasting flames." Evidently, our share of the Defense Agency's contract is small. However, lately we have come to realize our business practice is not adequate and the time has come when our company itself is starting to express the desire to serve more extensively.

Therefore, if the development of Japanese owned technologies, which has been talked about here, is ready to take off, I can honestly say that there is a way for our company, a maker which is starting later than the others, to be able to serve you in the field of research and development. Likewise, electronization is a very good idea from the point of business operations. In the past, technologies developed in Japan after so much devoted studies turned into useless treasures which were hardly applicable to anything else but defense purposes. However, with the "Seeds Orient" in particular, base technologies will be studied and far-reaching effects can be greatly expected.

With the said reasoning, first, I would like to request, as the others did, the gearing up of the technology enrichment policy.

Secondly, I would like to request that you start thinking of research and development of softwares as a developmental direction, although this request is slightly different from the others. As Watanabe and others have previously said, Japan has come shoulder to shoulder with foreign countries in many technical fields. Our weakness is not in hardware but in software in particular. I am sure we can be of service to you.

Additionally, we have some research institutes under our corporative structure. I regret to say, however, we have not sufficiently introduced these facilities to you for your contact in the past. Looking at the current ways things are going, there is a sign that the research workers themselves directly open business contacts with the Defense Agency. I would like to beg your kind and continued support in this matter.

Present State of Dependency on Private Sector for Basic Research

Host: Among various opinions and requests presented, is it a fact that the budget for basic research is insufficient, for one thing, and that the government is dependent on the private sector for various areas?

Ohmori: Well, I think that's true. Of course, if there is an ample supply of money, it will be different. How we manage to carry out our research and development within the very limited money is the question. In relation to this, we think the domestic defense technology can be categorized into three divisions.

Very simply speaking, a category represented by ammunitions, guns and missiles, which must be developed 100 percent by the efforts of the Defense Agency. Secondly, an aircraft category which will be actually operated 80-90 percent by the Defense Agency. Where basic aircraft technology is concerned, however, aircraft can serve both civilian and military needs without any discrimination once the superficial layer is removed, as you well know. As far as the said basic technology is concerned, the Defense Agency does not have to take the whole responsibility for it. The Science and Technology Agency or the Ministry of International Trade and Industry can be useful and share the responsibility. That does not mean the Defense Agency is entirely released from the responsibility. Certainly, the Defense Agency will be eagerly devoted to do the job, but the percentage of the involvement will be sizably different compared to the ammunition category.

Pertaining to the electronic equipment, as known to all, the technical level of the Japanese private sector is extremely high. In our primary stage, exaggerating a bit, the electronic features of a tank, for instance, a model 61 tank, was practically under 10 percent. In comparison, the percentage of the same increased to 20 percent in 1974 and will be increased to 30 percent in the next model to be made.

Statistical data shows that electronic weapons were scarce in the early days. As mentioned before, the electronic technology of the private sector has reached the world's top level through the history of three generations. Because the private sector attained such a high level, we fell in the pattern of asking for what we need from what you have. In a way, we have no excuse. On the other hand, we would like to use by all means your technologies renown for sophistication.

Nevertheless, the electronics for military use is much different from that for civilian use. For the portion which is different, we are convinced that we must take the initiative in conducting the studies even deep into the area of basics. We will try hard to get the budget for such an area of study. Anyhow, the research and development expenses of the Defense Agency is only one hundredth that of the U.S., and the personnel is also exactly one hundredth. With this in consideration, we cannot help but to ask for your contributions and cooperation.

Wada: Insufficiency of money is the primary restriction, of course, but before we say that, there has been a known conventional attitude of the Defense Agency or for that matter, of the entire government, an attitude that demanded a presentation of visible results without fail once the parties agreed to take the research and development work due to the official approach to research and development based upon a strong desire to obtain results produced by short work. Conversely speaking, we did not say that you could try to make something imaginative at a cost of possible failure, or you could try this and that but make something good through trial and error. I believe, however, we used to say that you should never fail to develop excellent completely finished weapons.

Under this atmosphere, when we compare the actually finished foreign products with the ones to be made at home with any 100 percent guarantee of delivery, we are likely to come to a conclusion that it is more expedient and reliable to import foreign equipment. Following this argument, we have, I suppose, been partial to introducing at least major weapon systems, especially aircraft and others such as missiles from abroad.

Host: Have you followed in that path fully in anticipation of the beneficial side of the technologies directly imported from foreign countries, for instance, you might have calculated that the imports would enhance the capability of Japanese corporations and would have far-reaching use in areas other than defense.

Wada: Responding to your question, I am afraid to say that we should have had such an affirmative policy and position to invest a great deal of money to defense related research and development in order to promote the science and technology of our country as a whole and the defense related technology, and eventually to encourage the far-reaching effect of these achievements on the private sector. Frankly, our practice to date was rather contrary. Among science and technology, it seems to me that defense technology has suffered from an extremely small budget. Whether this practice is bad or good is not the point I am driving at.

Well, I am sorry to quote statistical figures once more. However, the government's share of the expenses for research and development of the entire nation is almost one half in countries such as the U.S. and West Germany. Incidentally, this figure is much higher in the U.S. In Japan, the same share is about one quarter. The total national investment in total research and development is highly dependent on the commitments by the private sector. Among these, the investment to defense related research and development is piecemeal. You are quite right in saying so.

Develop Electronic Weapons Efficiently

Host: As somebody mentioned a little while ago, in some aspects, there is an unbearable lack of consistancy between development and equipment. Research and development cannot directly turn into equipment. Likewise, often you see that a project is assigned to one person, and when this man in charge takes another post or retires, the research and development pursued by him will disappear into thin air....

Wada: I understand you have multiple and various requests. Frankly, we feel we have achieved more than what we should be expected to in spite of such a marginal budget for technical development (chuckle). For example, we have developed PS1, F1, various missiles, model 74 tank and much more. I honestly feel we have done our work efficiently within this slim and tight budget.

Summarizing your requests presented before, first, you asked us to see to it that the results obtained by hard work be somehow utilized for actual production of weapons so that the staff engaged in research and development will not be disheartened. Another request was, I believe, that you are interested in getting our support for retrieval of the money invested by the private sector for voluntary research and development associated with the defense technologies but not covered by the money from the Defense Agency?

For your first request, we will be more careful and will comply with your request as much as possible since we agree there are some disappointments in that area. For the latter, I understand your point but I can only say that it is not possible to "agree" completely due to our national stance when you insist on recovering everything you happen to have voluntarily invested, since the voluntary investment of the civilian side was basically made, in a sense, at your own risk. I suppose risk taking is the foundation of private enterprise. It is free for you to explore. Good results are welcome and will be accepted, others may not be accepted. Acceptance or rejection is truly dependent upon the private sector's discretion and contrivance.

I would like to add one word more regarding the trend of the latest equipment very briefly. As the director of the Technical Research and Development Institute has been saying for some time, fundamentally, equipment has been largely electronized in recent years. Also, a systematization trend and a PGM direction are emerging.

Electronization is, in a way, the field Japan is very good at. In trading, our electronic products are somewhat pressuring the American electronic industries. That such an electronics as I just mentioned has come to play a fundamental and key role in weapons shall be considered a great advantage or a condition for development of weapons in Japan.

Three years ago when Dr Perry, who was U.S. Deputy Secretary of Defense in charge of research and development and procurement of equipment, visited Japan, I had an opportunity to chat with him. He was originally from Silicon Valley, California, which is the center of electronics. He was engaged in research activities there, and later became the president of the company. Eventually, he was asked by Secretary Brown to move up to take the position of deputy secretary of defense. The honorable Deputy Secretary keenly emphasized his acknowledgement that Japan and America are presently the world's two greatest authorities on electronics, and his confidence in that once Japan seriously strives for research and development, she can achieve enormous results. At that time, he visited many Japanese plants. Also, when he returned to Japan last May, I heard he went home deeply impressed by the Japanese progress.

As this story tells, as far as electronics is concerned, Japan really has great technologies in hardware, software and all sorts. Now that we have concluded that the future weapons cannot be conceived without electronics, and that we talked about the difficulty for one company to assess the entire picture of the total electronic achievements, we would like to investigate fully into these matters and hope to invent a system to maintain the high technical standard of the private sector to a full extent and to utilize it to its maximum.

Abe: As you have said correctly, the voluntary investment by a business enterprise has been made for its own future, and consequently, the company itself is liable for the risks, although I believe there is a limit to what it can risk.

However, as I mentioned before, we would really appreciate it if the government reveals to us their long term vision, the outlook of their experts regarding the direction of future research and development so that we can make our investment as effective as humanly possible.... Of course, it is only a prospect, and it may or may not come true. Nonetheless, if you can disclose something along that line, corporations will use that as a guide and investment specialists in the companies will decide on the areas for the voluntary investment, which, in the end, can help use the technologies available in Japan very effectively. It would be highly useful if you can give us some kind of hint, even a dream, as to the direction of the future defense. I feel it can really help us iron things out.

Wada: I agree with the point you made. I am not denying that there are studies in the Defense Agency in the area of subjects such as long term defense systems for integral Japan, various long term estimations of our country and how to operate these systems. I am, however, doubtful if we have all the conditions ready, at the current state of Japan, to disclose everything to the private sector. I will not and cannot say any further. I suspect there are some points which obstruct the readiress for this action you requested of us. We can do so only after we succeed in gaining a concensus of opinion for preparing the conditions concerned, but hardly under the present conditions in Japan.... We cannot openly reveal everything relating to military operations, defense systems and the like to men in private business. I have a feeling that there are, in fact, environments and conditions that do not allow us to commit ourselves to that openness.

Host: Well, there's no end to this subject apparently, but referring to the said long term vision, the BADGE X of this time is very much talked about. When and how are you going to start with it?

Wada: Plans and conceptions of BADGE X is now under investigation after receiving the budget for the investigation. I wonder how it will turn out. It all depends on the future budgeting. Using common sense, I expect the basic conception will be boiled down and the future direction of the project will be set in the next fiscal year.

Host: Do you think money will be available for investigation, next year?

Wada: I believe it will be also available in the next year. Remember, we are merely talking about the future budget, and we are right at this moment in the middle of working for budgetary requests.

Host: Is this money requested for in the estimated operations of the Air Self-Defense Force?

Wada: I am sorry, but I am not allowed to answer to that effect.

Host: Will the conventional BADGE be abandoned, and will a completely new one be introduced?

Wada: Essentially, what kind of general conception of BADGE X will come up is the question including what you have asked. The comprehensive vision or conception of BADGE X is what you want to know. When deciding upon these matters, naturally the experiences obtained by operating the currently running BADGE and the respective evaluations will be taken into consideration. All I can say about this subject is that it is now under scrutiny, and nothing more.

Host: As Director Ohmori stated, Japanese electronic technology has highly advanced and each of the companies represented here has the ability to deal with it. How about the possibility of the next BADGE being....

Wada: Fundamentally speaking, we have depended on imports or technologies introduced from abroad in many areas as far as the former BADGE is concerned. However, I feel this time we can add a lot to the list of what we can use from our domestic technical resources and productive power since electronic technology has made such a remarkable progress in Japan. That is what I expect, very roughly speaking. However, it is not yet at the stage when I can give you a definite answer to these speculations.

Host: Will it be something like, you develop it with the cooperation of each company using the American imported know-how?

Wada: In essence, the questions regarding the conception of BADGE and what is to be done and the question of what's wrong or what's good with the existing BADGE and the like are currently being boiled down. After all these matters are settled, that is, after the conception of the project is confirmed, only then will we start to talk about whom and how we will ask to do the job. However, we don't have the stage prior to that consolidated yet, and consequently, I am not able to state anything at all pertaining to the question you have just raised.

Host: Do you, representatives of each company, have any requests for the areas such as improvement of weapons currently in our possession and the upgrading of their performance?

Yoshida: Recently, a component related technology has been in progress, and some components such as new IC and LSI have been extremely miniaturized. So, for the machine parts which aged to some extent, there are plenty of actors that allow space-oriented miniaturization of the conventional units.

Therefore, speaking of electronic machine parts, FCCM (Electronic Counter Counter Measure) for countering radio interruption by an enemy, for instance, requires new circuits and units. Here, it has naturally become possible to use new electronic technology and replace the conventional mono-functional unit by a multi-functional unit. Reviewing the conventional machine parts in this respect, we can come up with many contrivances which can extend the capacity of a system by refreshing its function and performance and simultaneously can consequently reduce the maintenance expenses of a set provided with an improved reliability and maintainability achieved by reforming units to semi-conductors. This is the area we would like to consult and cooperate with you, in parallel with new developments, so that the Defense Agency's budget can be effectively utilized.

Host: The advancement of the electronic technology is remarkable, and European nations eagerly export arms to relieve unemployment. What I am going to ask you, Chief Wada, may be beyond your power and requires the strong support of the entire government, but can you somehow gear things up toward the export of arms, which I am certain will help in promoting technology and reducing the cost of weapons?

Wada: MITI and the Foreign Ministry are the competent authorities in this area. The Defense Agency is on the side of the users and obtainers of the equipment. Please, consult MITI and the Foreign Ministry in matters related to the problems of the entire industries and the effects of exports on diplomacy respectively. The final process is the application of the Export Approval Standards of the MITI. That's what it probably would take to pursue your idea.

As you know, there are the "Three Principle Rules of Arms Export" which is the policy of the Cabinet, and the unified policy of the Cabinet such as the one that took effect at the beginning of 1976. I can only say that we are going to think about it within the bindings of these policies.

Host: Aren't there a considerable number of voices raised by the industries for export of weapons? Don't you think it's better to appeal for this at various opportunities you may have?

Wada: Well, to be frank with you, I am not sure but I feel the industries are rather coolly accepting the export issues. At one time, such voices were loudly audible. Recently, however, they have settled down, and I believe that the industries are now well aware of the pluses of not exporting arms.

Host: Thank you for your contributions.

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CSO: 4105

ASDF THUNDERSTORM DETECTING SYSTEM PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 8

[Text]

A program for developing new thunderstorm detecting equipment for the ASDF has entered its final stage with fabrication of the ground equipment to be finished this fiscal year. Technical tests are planned for FY 1981. If the test results turn out good, the equipment will be delivered to the ASDF for practical operation in FY 1982.

The program was launched in FY 1970 after an ASDF F-104 fighter crashed into central Kanazawa City after being struck by lightning.

Following three years of research on ground-based thunderstorm detecting equipment, the JDA fabricated two atomospheric electricity detectors, nine electric field meters, a weather radar system and a thunder data processor from 1975 to 1976. They were tested at Komatsu ASDF Base and Kanazawa City from 1977 to 1978. Also, one atmospheric electricity detector, 18 electric field meters and a data processing computer have been fabricated since 1979. Their installment is underway for the tests in FY 1981.

CSO: 4120

TR&DI TO DRAFT REQUIREMENTS FOR XSSM-II BY MARCH

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 9

[Text]

The TR&DI intends to draft operational requirements for the XSSM-II ground-launched antiship missile by the end of next March or FY 1980 and start technical development of the new missile for the GSDF in FY 1982.

The XSSM-II is designed to attack enemy ships from coastal areas. It is based on the ASM-I air-launched antiship missile developed for the ASDF. A jet engine will be used for the XSSM-II instead of rocket propulsion to improve range.

For technical research on the new missile, about ¥650 million is appropriated under the FY 1980 budget. The TR&DI has requested an additional ¥450 million for FY 1981. If the request is approved, it would be able to finish technical research in FY 1981 and launch technical development in FY 1982.

The ASDF is interested in the XSSM-II program because of an ASDF/TR&DI plan to develop a modified ASM-I using a jet engine. The modification program is expected to begin in FY 1982 after evaluation of the XSSM-II research.

CSO: 4120

TESTS OF GRENADE LAUNCHING RIFLE EXPECTED SOON

Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 9

[Text]

The GSDF/TR&DI plan to carry out functional tests of a new grenade launching rifle under development in the second half of FY 1980 as practicability tests in FY 1979 turned out a method for maintaining better functions than originally required, according to informed sources.

The grenade launching rifle, as part of the GSDF's antitank weapons systems, will be deployed for smaller infantry units. Technical development started in FY 1977 after technical research under the FY 1967-71 Third Defense Buildup Program and test fabrication from FY 1975 to FY 1976.

The soldier-carried weapon is designed to be recoilless on launching unlike the Carl Gustav FFV-550 84mm antitank weapon which the GSDF has been procuring since FY 1979. Although most handcarried weapons of this kind in foreign countries have some recoil, the GSDF wants to eliminate all recoil from the new grenade launching rifle. Therefore, research has centered on how to reduce launching shock while maintaining high accuracy. The TR&DI has found an appropriate launching attitude through past tests, paving the way for the final tests.

CSO: 4120

TR&DI'S RESEARCH PROJECT ON AIRCRAFT NOISE REDUCTION

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 7-8

[Text]

The Technical R&D Institute (TR&DI) of the Japanese Defense Agency (JDA) submitted a report to the JDA's 22nd research evaluation meeting Nov. 12 on its research for reduction of aircraft noise levels, especially noise of low-bypass-ratio engines.

A gist of the report follows:

Purpose of the Project

There are many aircraft meeting strict noise requirements at present. However these aircraft are equipped with turbofan engines with high bypass ratios, in which noise reduction measues are employed only for fans. In engines with low bypass ratios for aircraft featuring high-altitude and high-speed capabilities, measures must be taken against jet noise as well as fan noise. So far, little research has been carried out on jet noise reduction. The project covers jet and fan noise reduction using the XF3-1 low-bypass-ratio turbofan engine.

Tests

In six different tests, the engine was mounted on a 1.8-meter stand. Noise levels were measured at a range of 30 meters from the engine for 20 seconds after the engine entered stable operation. Singles were recorded by FM multichannel data recorders. The data were processed by a frequency analyzer to compute noise level reduction.

Test Results

Fan noise can be reduced by polyamide felt noise-absorbing materials placed at the inlet and outlet of the fan. If the engine speed increases, however, jet noise rises. An exhaust silencer is effective for lowering jet noise. Thus, a combination of the noise-absorbing material and exhaust silencer will help reduce noise of the low-bypass-ratio turbofan engine. Remaining problems involves endurance. Although the exhaust silencer decreases engine power by 2 percent, a change in the shape of the silencer can reduce this drop.

CSO: 4120

TR&DI TO PROCURE BK-117 FOR MISSILE TESTS

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 p 9

[Text]

The TR&DI is expected to request ¥400 million in the FY 1982 budget to purchase a BK-117 helicopter as a craft specialized for technical tests of new missiles.

The BK-117 medium multipurpose gas turbine helicopter is now under development by MBB and KHI.

The expected request will cover IFR equipment and other optional components, spare parts, training expenses and other costs as well as a BK-117 airframe valued at ¥200 million.

The TR&DI had originally planned to procure the craft under a FY 1981 budget request. This plan was canceled because of opposition from JDA internal bureaus. However, the necessity of such a craft has increased as development of new missiles has become extensive. The TR&DI attaches importance to the craft for technical tests as well as promotion of missile research and development projects.

The BK-117 has been tentatively selected because a helicopter with hovering functions is more useful than a fixed-wing aircraft for airborne missile tests, in which the craft acts as a telemeter transmitter and an optical meter.

CSO: 4120

MELCO CONTRACT WITH MBB ON SATELLITE CONTROL SYSTEM

Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 9-10

[Text]

Mitsubishi Electric Corp. (MELCO) has signed a contract with MBB of West Germany to import technology for the three-axis attitude control system for satellites. The contract will be approved by the Bank of Japan by the end of November.

The technical cooperation contract demonstrates that Japan is able to import space technology not only from the United States but from other countries. This country has so far depended on the United States for space technology.

Under the contract, MBB will check and review the controlled bias momentum formula for the three-axis attitude control system which MELCO has developed for the MOS-1 maritime observation satellite to be launched in FY 1984.

So far, Japan has imported complete attitude control systems, including a General Electric system for an experimental broadcasting satellite, named "Yuri (lily)," launched in 1978. The ETS-III technical test satellite, to be launched in 1982, will also use a GE system.

In a bid to domestically produce the control system, Toshiba Corp. once asked GE to provide technical assistance. GE rejected the request on ground that its technology involves military secrets.

Due to the rejection, the Space Activities Commission requested the domestic industry to develop a control system for the MOS-1 and other large satellites. Although MELCO has developed the controlled bias momentum formula, there are no Japanese experts to check and review it. Therefore, MELCO concluded the contract with MBB.

The Science & Technology Agency has observed the contract is extremely significant. The West German government also welcomed it at a recent meeting with Japan in Bonn under the Japan-West Germany science and technology cooperation agreement.

MELCO intends to hold experts' meetings with MBB as soon as the contract is approved by the government. Their technical cooperation is expected to pave the way for their closer relations.

CSO: 4120

SCIENCE AND TECHNOLOGY

BRIEFS

PROGRESS ON AW-X ANTIAIRCRAFT SYSTEM--The Defense Agency will award contracts totaling Y760 million to Mitsubishi Heavy Industries (MHI) and Japan Steel Works Ltd. for fabrication of a complete prototype of the AW-X self-propelled antiaircraft machine gun system now being developed for the GSDF by the TR&DI. MHI will handle fabrication of the chassis and Japan Steel Works the turret system. The AW-X prototype will be based on the Model 61 tank chassis and be equipped with an Oerlikon 35mm antiaircraft machine gun system. Development of the fire control and signal processing systems was funded in FY 1979. Although the Model 61 tank chassis will be utilized for the prototype, some officials suggest use of the Model 74 tank chassis for production vehicles. A decision on the chassis type for the production model will be made after evaluation of the prototype vehicle, sources report. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 10]

NEW B-X MINES PROCUREMENT--The MSDF intends to start full-scale procurement of new B-X mines in FY 1981. It has already earmarked funds for about 50 B-X mines in its budgetary request for the fiscal year. Practicability tests of the new mines by the MSDF finished in FY 1978, paving the way for full-scale deployment. Research and development of the new mine originates from the period of the Third Defense Buildup Program. The B-X mines are to be laid on sea's bottom by aircraft and ships. According to military experts, the domestically developed B-X mine is as excellent as advanced mines of major military powers. Therefore, MSDF units are eager to deploy the new mines. The B-X mine has been developed in cooperation with Hitachi Ltd., Hitachi Shipbuilding & Engineering Co., Nissan Motor Co., Oki Electric Co. and other manufacturers. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 19 Nov 80 p 10]

R&D OF AIRBORNE FCS--The TR&DI has requested about Y170 million for FY 1981 to launch research and development of an advanced airborne fire control system (FCS). It will fabricate an active phased array radar antenna for basic research from FY 1981 to 1982 and a prototype FCS in three years from FY 1983 for technical tests in FY 1985 and 1986. THe prototype FCS is expected to be tested on an F-4EJ or F-1 fighter. The new FCS is designed to counter low-altitude, high-speed targets and multiple targets, and meet the requirements of future control-configurated vehicle (CCV) fighters. Total development cost is estimated at Y7,000 million over seven or eight years from FY 1981. The TR&DI aims at making the new FCS superior to the Hughes APC-65. It wants to use the system for the FS-X and other future fighters. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 p 8]

SECOND-STAGE F-1 APS PROGRAM--The Central Procurement Office of the JDA has selected Mitsubishi Heavy Industries Ltd. (MHI) to modify an F-1 support fighter to accommodate a new auto pilot system (APS) under the second stage of the TR&DI's F-1 APS development program. It will start negotiations with MHI after receiving the firm's estimate. A contract is likely to be signed next March or at the end of FY 1980. For this contract, about Y600 million is in the FY 1980 budget. A Y613,261,000 contract on fabrication of the APS for the F-1 in the first stage of the program was concluded with MHI in FY 1979. Fabrication has been undertaken by Japan Aviation Electronic Industry Co. acting as subcontractor. Technical and demonstration tests of the APS are expected to start in the latter half of FY 1981. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 26 Nov 80 pp 8-9]

ON ROBOTICS--Are industrial robotics the secret of the remarkable productivity shown by Japanese factories? This is quite possible in view of the commonly mentioned figures, both in Japan and abroad: according to the Japan Industrial Robot Association (JIRA), there were 54,000 robots in service in the industrial field at the end of 1979 (in other words, more than 80 percent of the world total), used mainly in the automotive, electrical assembly line and plastics processing fields. However, these statistics are biased; JIRA includes in its definition of a robot the manual manipulators (15 percent of total production) as well as the fixed-sequence manipulators (47 percent), which are not considered such by foreign manufacturers. If a stricter definition were to be adopted (variable-sequence manipulators, apprentice robots, numerically-controlled robots, intelligent robots), Japan's stock of robots would actually have amounted to 8,500 units in 1979, compared to approximately 3,500 in the U.S., out of a total world stock estimated at 16,000 units. Likewise, official growth forecasts for the production of robots are notoriously over-estimated (probably to encourage new manufacturers). Forecasts predict a genuine boom, going from 110 million dollars in 1978 to 1,200 million in 1985 (a third of which for export, as against only 3 percent in 1978). More realistic, but also less propounded estimates foresee a production amounting to approximately 420 million dollars in 1985. [Text] [Paris LE MONDE in French 18 Nov 80 p 5]

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